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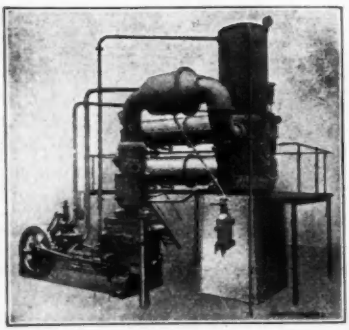

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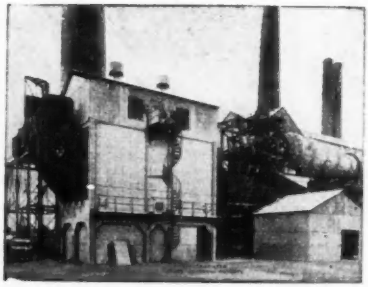

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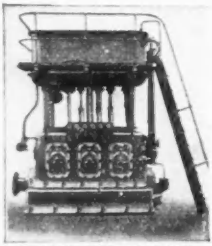

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Looking Ahead

THE people of this country can be divided in many ways, and among these is their attitude to the war. It has suited some daily papers and those Government departments that have to do with the provision of munitions of war and the control of man-power to encourage the cry that nothing else matters but winning the war, and to instil into us the conviction that all forms of post-war planning should be left until victory has been won. A saner view is that taken by Mr. E. H. Gilpin in his recent address to the Industrial Co-partnership Association: "The silly cry that we should think only of winning the war," he says, "has to a very large extent died away—people have realised that the object of war is peace, and that we must prepare for peace courageously; we lost the last peace because we did not prepare for it." We must not make the same mistake again. It is true that our efforts must be devoted to winning the war first and foremost. We must have our cake before we can eat it. But with that reservation, post-war planning must occupy the thoughts of captains of industry and of certain departments of Government. We do not care to reflect what will be the condition of the world within a couple of years of the declaration of peace if there is no adequate planning for it in advance.

Where do we stand in this country? For years before the war our imports were above our exports in value, and we were only kept solvent and with an adequate standard of living—an *average* standard of living with which most people are profoundly dissatisfied, to judge by current comments—by our "invisible" exports in the shape of investments and services. Those investments were liquidated to buy munitions at the start of the war, and much of the heritage that our fathers had left us went up in smoke in the red flames of Mars. The growth of American shipbuilding does not suggest the same post-war scope for our shipping as there has been in the past. What, then, is our outlook? Where shall we find the money for such luxuries as the Beveridge scheme if we are facing bankruptcy as a nation? It is well to speak plainly. Social reform and social betterment are fine ideals; so also are many other things which we think we want. But they need paying for, and frankly the outlook is pretty grim. All depends on planning ahead so that we can

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avoid the paradox wherein one country secures the lion's share of trade while others look on wistfully and covetously. Yet if business men are left to themselves in the free competition of pre-war years, that is what will happen. The business man quite naturally puts his own business interests first. It is the task of Governments to see that the interests of mankind come first and that business is so regulated internationally that whatever trade there may be is fairly shared between nations. There is evidence, as Mr. Gilpin says, that we are ready as never before to make whatever changes in our social fabric may be necessary.

One of the first signs of this is a growing feeling among industrialists that cut-throat competition is an unsound method of doing business. Jungle law is not really the sound business method that the Victorians thought it. There is a growing disposition to form business organisations to eliminate or reduce the keen wind of competition and so to manage business that, while safeguarding the interests of consumers, it may yet give to every efficient firm a share in whatever trade is going and so enable all to live through depression and prosperity alike. The formation of Export Groups, whereby whole industries act in concord in the Export Market, is one of these movements. By its success it has fostered the formation of other similar bodies for home trade. In union lies strength and many of our more conservative industries have discovered that.

A second way of looking ahead is to devise means whereby trade may flow freely in the absence of the normal inducements. If a country desires to raise its standard of living, it must generally import quite a lot of its needs. Perhaps the U.S.A. and to a lesser extent the U.S.S.R. are unique in needing to import much less per head of population than anyone else. To import goods, countries must have currency, and if they are not rich enough to possess the vast reserves of cash that are needed they must have exportable assets either existing as minerals or created by the skill of their peoples. But what do we find? That the countries of Europe and Asia are poverty-stricken and denuded through war, that they have no industries and no assets and that they cannot hope to buy from us or from anyone else. There are all the elements of a great trade depression in the making, and paradoxically, at a time when the demand for goods and services was never likely to have been so great. We must plan ahead to find some means to overcome this and to encourage trade to flow in default of the possession of the necessary ready currency or exchangeable goods. Economists, it is believed, are not unmindful of this problem, but it is one in which Governments must interest themselves.

It is undeniable, as Mr. Gilpin points out, that peace will bring no slackening, but only a reorientation of effort. Someone has said that there will be no demobilisation, only remobilisation. There is so much to be done, and so little time in which to do it. In view of the immense amount to be done, should we not plan ahead now? Should there not be an international survey to discover what needs there will be to be supplied all over the world, and to put these into some order of urgency? In making this statistical survey it would also be possible surely to devise means whereby the trade that is available will be divided among the industrial nations of the world. This involves, as Mr. Gilpin points out, the organisation of research on exportable goods to adapt them to the needs of widely various consumers. Much could be done to improve our products: nearly every industry thinks that it is efficient and that it manufactures articles that can hardly be improved, and almost all are labouring under a delusion. Proper representation abroad and research at home to meet the needs of other climates and conditions will be needed if we are to hold our position. Whatever delimitation of trade may result from international action in no way absolves us from the task of fitting our products to meet the needs of our customers. There can be no slackening of our efforts towards technical perfection.

There is much that is wholly admirable in Mr. Gilpin's address. There is also much that has been said in these columns before, but that in no way detracts from their truth, nor from the desirability of saying them again. Reiteration ultimately attains the force of logic by provoking thought. If we as a nation will think about post-war problems, we can solve them. If we do not think about them, we are indeed lost.

N_2O – by Neil Nettleton

RESEARCH UNDER DIFFICULTIES

NOTES AND COMMENTS

Chemists to Unite

AS will be seen from a letter further on in this issue, working chemists have at long last made a move to overcome the perplexing inhibition, which, up to the present, has prevented them from co-operating to attain that position in the body politic which their skill and learning entitled them to assume. The seven aims stated in the present manifesto prove, on examination, to be perfectly modest and reasonable, and it is difficult to see how any valid objection can be raised against their fulfilment. In a world in which science is bound to play an ever-increasing part, chemists have not merely a right, but also a duty, to assume larger responsibility in the conduct of affairs; and it is by the creation of an authoritative body, qualified to speak for the profession as a whole, that they can best exercise this responsibility. As is pointed out in the letter, the war has this at any rate to its credit, that it has hastened the type of movement—the urge towards co-operation—which the document advocates, and amid the welter of plans and counter-plans, it is this sort of scheme which is going to prove of real benefit to industrial humanity. The imposing list of signatories to the letter is sufficient warrant that the notion scheme is not merely the notion of a body of eccentrics. These men and their successors will be the architects of a chemical edifice on a stable foundation; and we look forward to seeing the building of such an edifice in the literal as well as the metaphorical sense.

State Factories

WINDING up the two-day debate on economic policy last week, Mr. Dalton, President of the Board of Trade,

drew attention to a number of problems of intimate interest to the chemical industry and its post-war position. An investigation was already afoot, he said, concerning the potentialities of state-owned munition factories, all of which would not, of course, be required in peace time for their present purpose. Stress was to be laid on those plants in what had been distressed areas, where employment had been found to be insufficiently diversified. Bearing in mind the fact that most of these areas were within convenient reach of good fuel supplies, industrial chemists should not overlook the opportunity provided here for wider development of their own activities. Mr. Dalton said that he was also inquiring what new products might have been developed as a result of new inventions, etc., and what new varieties of existing products could be placed on the market. It is rather surprising that he should put it in this way. With, perhaps, too child-like a faith in the omniscience of Whitehall, we should have thought that the Board of Trade would have kept a file somewhere or other with a list of the new products developed as a result of the martial stimulus to inventiveness. If such an arrangement does not exist, however, it is as well that the Board of Trade should get on, as speedily as possible, with repairing the omission.

Industry and Education

A GROUP of workers researching into the economics of education, including Sir Walter Citrine, Sir Lawrence Bragg, Mr. G. D. H. Cole, Dr. Cyril Norwood, and Mr. Samuel Courtauld, have signed a statement on "Industry and Education," in which is suggested a new plan of educational reform. The signatories stress the need for doing everything possible to raise the quality of entrants to apprenticeship in the skilled manual crafts, and point out that this can best be done by making technical colleges the nuclei of a new type of people's college. The grouping of the technical college and other suitable institutions to form a people's university, says the statement, offers by far the best hope of endowing higher technical education with that cultural quality in which it is too often deficient, and of making it a school of personality and leadership as well as of technical skill. Other points suggested are the use of qualified industrial research workers to give regular lectures to university students, a year's break between school and university training, refresher courses for high executives in business and industry, and periods of service in industry for university teachers and research workers.

U.S. Synthetic Rubber

THE U.S. synthetic rubber programme has evidently run into some larger snags than were expected. Production is now much behind the schedules suggested by official spokesemen last autumn. Only a few of the larger butadiene plants, for instance, were more than a quarter the way to completion at the end of 1942. It was recently estimated that rubber requirements for the current year, without taking the necessary accumulation of stocks into consideration, would amount to about 580,000 tons, while crude supplies would be only 400,000. This leaves a deficit, to be made up by various means, of 180,000 tons, to which must be added at least 50,000 as a normal figure for operating inventories. The Baruch report some months ago stipulated that, in order to avoid a drastic running down of stocks, which might bring damaging circumstances in its train, synthetic production would have to be raised to some 425,000 tons during this year. On a production of 200,000 tons it was stated that stocks would be brought very near to exhaustion point. It is hoped, however, that Buna rubber production may amount to a total of 295,000 tons over the year, while other types, principally neoprene, thiokol, and butyl rubber, will bring this figure up to 320,000. The outlook, far from rosy, is not as serious as it might have been.

U.S. METAL CONTROL

The War Production Board in Washington continues to tighten its control of steel output and reductions in the original quotas for the first quarter are being made wherever possible, according to Reuter. Application of the controlled materials plan to exports has been announced by the Board of Economic Warfare, which has called for exporters to submit applications for steel, copper and aluminium for filling of foreign orders. Exports of copper and spelter under lease-lend during 1942 represented 7.2 per cent. and 12 per cent. of the new supplies.

British Non-Ferrous Minerals

The Exploitation of Domestic Resources

by W. D. REYNOLDS

THE problems referred to in THE CHEMICAL AGE on October 3 last, under the titles "Output and Efficiency" and "Canadian Tungsten—Prospecting for Scheelite," while drawing well-merited attention to certain points, fail to strike at the root of the all-important matter of raw materials and machinery required, or to indicate why the immense mineral resources in this country are inefficiently and wastefully exploited in such a way that certain minerals, equal or superior in quality to what was previously imported from abroad, are not produced in any quantity. It is proposed to deal separately with the various minerals in a series of short articles, the subject being far too large to be dealt with in one breath.

I.—Introductory

Dependence upon foreign markets has, in the past, proved most unfortunate for home producers of tin, tungsten ores (wolfram and scheelite), lead, zinc, arsenious ores, barytes, strontium sulphate, and fluorspar, and, amongst the non-metallic minerals, gypsum, and silica sands for glassware and other uses, including moulding sands for foundry and general metallurgical purposes. This is especially noticeable now, when the need for adequate supplies of suitably refined minerals is vital. The lessons of the last war have very largely been wasted, and until more scientific methods are applied, this country must continue to suffer in consequence of the inability of home producers to supply a sufficiently pure material in adequate bulk. The foreigners have the advantage of possessing much larger deposits containing mineral usually in a purer state than those situated at home. Given the application of the required higher standard treatment technique, this advantage can be appreciably reduced or removed and, generally speaking, at a pre-war cost per ton not exceeding the cost of the then imported articles. Allowances must, of course, be made for higher working charges to-day.

Improved Technique Required

Although in 1922 the Board of Trade issued a Departmental Report dealing fully with the non-ferrous mining industry and in particular stressing the need for improved technique to increase the percentage recovery of black tin from the ore, little or no improvement has yet been effected. Where processing has been advanced, it has been more or less confined to sectional stages, and those responsible for such improvement apparently lack the knowledge sufficient to co-ordinate and bring into line all the operational stages so as to obtain the full advantage of such sectional improvement.

Points for Attention

To get down to the root of the home producers' inability to compete with pre-war imports, a careful study of the treatment technique in vogue to-day and of the corrections necessary to rectify it is essential. In brief, the following points seem to need attention:—

1. Attempts to dovetail new plant and ideas with old methods and practices tend to aggravate rather than cure the trouble, as they completely fail to recognise its true source. Wide investigations at home and abroad conclusively prove that many such troubles are actually "created," and would in most cases be non-existent, given the application of modernised processing technique.

2. Failure to recognise that no two mineral deposits, even of the same mineral, are necessarily exactly alike from the standpoint of chemical and/or mechanical treatment. Skilled attention must always be paid to the variations in the lode formation and the associated impurity content. While chemical analyses are essential, it must be understood that analysis alone is insufficient to determine either the plant or treatment. With expert examination of the mineral at its source, it is possible to make a correct diagnosis and to prepare the required treatment and plant, and thus obtain

maximum quality results at reasonable cost per ton. This calls for highly technical and specialised knowledge of the subject as a whole. The aim must always be to "reduce or remove the actual cause of processing difficulty at the earliest possible stage, and before it becomes a source of insurmountable trouble during later stages in treatment." Non-observance of this can only lead, as at present, to inferior results at unnecessarily high cost, coupled with indifferent percentage recovery.

3. When installing new plants it is commonly expected that one machine or another should remedy the faults at *one* operation, whereas the installation should provide for processing to be performed stage by stage, thus permitting each machine to function to the best advantage, fed with a properly prepared feed best suited to what is required of that machine. Concentration tables and jigs, for instance, as handled to-day, give only 60 per cent. to 80 per cent. efficiency. Flotation represents a big advance, but often fails to produce maximum good results, generally speaking, because of the conditions of the feed. Excess of slimes is another particular source of trouble, due to faulty initial technique.

4. Apart from the treatment of tin and tungsten ores to obtain increased extraction and purity, fluorspar, bartyes, strontium sulphate, gypsum, and silica sands are outstanding cases for specialised attention where the technique as employed to-day calls for severe condemnation.

5. To obtain the highest degree of purity, together with the maximum percentage recovery and low costs, it is essential that the necessary stages in treatment should be co-ordinated, and bear a proper relation to the whole, including the mineral itself and its associated impurities. This subject, unfortunately, is very poorly understood, as witness the inferior results marketed to-day.

6. Processes have been developed and plant designed to meet the situation, coupled with provision for appreciable recovery of the chemicals for re-use, the final determination of which depends firstly on expert investigation at the mineral source, and afterwards on the design of the plant required to meet special individual cases; for this some of the machines of to-day are not altogether best suited.

II.—Barytes

Fine White Powder Needed : Export Possibilities

Germany and America are the principal sources for barytes, with the United Kingdom, France and Italy occupying rather subsidiary positions. Occurrences are known in other countries where output will expand as the demand increases. Barytes—crystalline, translucent and amorphous—is rarely found in the pure state. The associated impurities may include galena, blende, fluorspar, manganese, copper, iron and carbonaceous stainings, calcite and quartz, etc. No two deposits are exactly alike, and expert examination, together with chemical analyses, is imperative before correct mining instructions can be given and adjustments made to processing plants.

Present-day refining methods for barytes are more or less standardised, but they fail to produce quality results. Differences in quality of the material produced are almost entirely governed by differences in the quality of the raw material, and are not due to differences in processing skill. The best German and Italian finely-ground barytes, although not pure white, is superior in colour and quality to that produced here at home.

Advanced technique is essential if a high degree of purity, combined with low cost in manufacture, is to be effected. Expert diagnosis can determine the use to which individual types and their associated impurities are best suited. There are, for instance, varieties of barytes in this country which are wastefully employed in the production of off-colour products, particularly so in the manufacture of barium salts, blanc fixe, lithopone, etc., when, if subjected to modernised treatment, these would produce a finely-milled pure white product at low cost suitable for paint and other industrial uses. White powder of this type, because of its increased covering

power, purity, and lower production costs, is competitive with blanc fixe.

The first essential, when investigating an approved minefield for processing purposes, is the correct classification of the different grades in relation to the impurity content. It is sometimes found that the more awkward impurities tend to congregate in a small section of the lode, usually in the vicinity of the hanging or line walls. There have been instances of this among both home and foreign deposits. In one known instance, a 20 ft. width composed of platy and translucent barytes coated with black carbonaceous matter, iron-stained and intermixed with specks of galena, it was found that a finely-milled powder, pure white by the simple turpentine colour test, could be produced from 18 ft. of the lode, but the remaining 2 ft. contained a proportion of a coke-like substance impregnated with manganese. The resultant unstable salts released when the latter substance was included in the bulk tended to destroy the value of the whole width from the point of view of colour.

Types and Variations

As there are so many different types and varieties of barytes and so many variations of impurity content, they all require individual investigation. When the inherent pink variety, saturated with colour throughout, predominates, it is impossible to produce a pure white result at economical cost, and this material, after treatment, should be allocated for other commercial uses. It should be noted that crystalline barytes always retains its crystal structure, however finely ground. An examination under the microscope, at 2000 diameters magnification, of particles ground to 6μ size, will quickly reveal this fact, even though the mass gives a velvety feel. This is the preferable size for paint and similar industrial uses, because of its high covering power as against blanc fixe at 1μ size; anything over 10 to 12μ tends to coarseness.

Having completed the initial investigation, steps should be taken to determine the plant requisite for processing, and arrangements made for a bulk supply of ore, amenable to cheap treatment. The mechanical side is of the utmost importance, because, unless the chemical plant is supplied with a feed suitably prepared, the cost per ton increases and failure will result. Treatment plants should be automatic in action with minimum labour requirements. Costs per ton can then largely be a question of h.p. hours and the amount of chemicals consumed and lost per ton of ore processed. The percentage of loss, should, however, be relatively low when employing special plants and methods.

Special stress should be laid upon production for export, but for barytes to be competitive in American markets, a pure white finely-milled powder must be manufactured. Owing to its heavy specific gravity(4.5), barytes requires less shipping space per ton than many other lighter and more bulky goods which are exported to-day. It also enjoys the advantage of being cheap to manufacture, yet commanding a high saleable value. One known domestic minefield alone could be made to provide a tonnage of 50,000 to a 100,000 tons a year provided the owners were willing. The manufacture of a pure white finely-milled barytes, primarily for export, may be classed as a matter of national importance. Sympathetic consideration should be given to it by the Government, and the necessary plant priorities granted in order to encourage production.

Iron Ore Producers

New Association Formed

PRODUCERS of ironstone and iron ore throughout the country have formed a new organisation, to be known as the National Council of Associated Iron Ore Producers, to consider and advise on all matters affecting the iron ore and ironstone producing industry. It is understood that the existing district associations will retain their full autonomy. The first chairman is Mr. F. Scopes, managing director of the Stanton Ironworks Company. The vice-chairman is Mr. Arthur Dorman, of Messrs. Dorman, Long and Company. Mr. P. Wilson, 50 Meadow Road, Kettering, is the secretary. One of the first actions of the Council was to appoint a committee under the chairmanship of Mr. Scopes to consider the problems of restoration of land after the working of ironstone. This committee will continue the work done by the *ad hoc* Committee of Producers, which submitted evidence to the Kennet Committee in 1937-38 and which has since given much attention to the problems arising as a result of the increased war-time output of ironstone.

Organic Insecticides

Suggested Substitutes for Lead Arsenate

ONE of the many fields in which inorganic substances are likely to be displaced by those of an organic nature is that of insecticides, and during recent years many research chemists have been concentrating on the production of compounds that are either extracted from plants or synthesised from products derived from gas, petroleum, shale oil, coal, or plant materials. It happens that the most important inorganic compound for which substitutes are needed is lead arsenate, which has for long been considered the most effective insecticide for the codling moth and other destructive fruit and vegetable pests. Lead arsenate is now losing favour with growers because it does not give as good control as is expected of it, and also because it may leave two objectionable elements—lead and arsenic—on sprayed or dusted food products.

Neonicotine

The most promising insecticides of plant origin for use against the codling moth is nicotine. Search for a nicotine compound not easily washed off from sprayed fruit and foliage by rain—an objectionable feature of the nicotine compounds previously tested—has led to the preparation of nicotine peat—a combination of nicotine and powdered peat. Peat, acidic in nature, combines with nicotine, a base, but in different proportions according to the nature of the peat. Pre-treatment of most peats with acid improves their combining power, and appears also to increase the proportion of nicotine that is not soluble in water, which is a quality highly desirable in sprays for use against the codling moth. Preliminary tests show that nicotine peat is very poisonous to larvæ of this insect.

Preparations containing rotenone are now widely used; certain disadvantages, however, bar their use for some types of insect. For example, derris is not effective against all insects; it is of little use against the celery leaf tier or the common cabbage worm. Like many other organic compounds, rotenone and related compounds are rather easily destroyed by sunlight. Although toxic to codling moth larvæ in the laboratory, rotenone preparations, exposed to light and air in a thin spray film, decompose too rapidly for economic use. If the present search for a stabiliser is successful, however, these compounds may become valuable orchard sprays.

There is little hope at this time of being able to synthesise, even in the laboratory, organic compounds having structures as complicated as those of rotenone and nicotine. Not much is known about the relation between structure and insecticidal value. Attempts to prepare compounds related to nicotine, but having a simpler structure, have been successful in just one case, that of neonicotine. This compound was made in the laboratory before it was found in nature. It is now known to be identical with anabasine, discovered first in a Russian weed and later in the roots and leaves of the tree tobacco.

One organic compound that promises well as an insecticide—phenothiazine—has been synthesised in the laboratory from sulphur and a commercially available dye intermediate. Even though little is known about the relationship between chemical constitution and insecticidal efficacy, as mentioned above, chemists were led to this compound because they had learned that the introduction of sulphur, which is an insecticide itself, is likely to make organic compounds good insecticides.

Inorganic Improvements

At the same time certain inorganic compounds have kept their place in the search for lead arsenate substitutes. Attention naturally went first to other compounds of arsenic. Calcium arsenate is one of the most promising substitutes for lead arsenate, but, because of a wide variation in manufacturing methods, results with it have often been inconsistent and unsatisfactory. The temperature at which calcium arsenate is made, the ratio between the lime and arsenic acid, and the size of the particles probably all have a marked effect on the action of this material. All these conditions are being studied. New variations of Paris green, the standard codling moth insecticide 30 years ago, were prepared by adding to copper arsenite such acids as formic, propionic, butyric, palmitic, and stearic, in place of the usual acetic acid. Several of these "greens" are more effective than ordinary Paris green and are less soluble in water.

The process developed by the Finnish chemist, Dr. A. Wuorinen, for the chemical utilisation of wood is to be applied on a large commercial scale in a new plant to be erected by the Finnish Alcohol Monopoly. The new plant will have a capacity of 10,000 tons per annum of power alcohol, and other products obtained will be dextrose, fodder yeast, and lignin. Dr. Wuorinen's process is stated to be based on the use of greatly diluted sulphuric acid at high temperatures.

The Structure of Post-War Industry

The Need for Immediate Planning

by E. H. GILPIN

TO the chemical industry, and especially, perhaps to the chemical plant industry, the revival of export trade is of vital importance. The following address, by the Chairman of the Food Machinery and Chemical Plant Export Group, delivered at a meeting of the Industrial Co-Partnership Association on January 21, is therefore of the highest importance, outlining as it does the steps that will have to be taken in the way of rationalisation if we are to realise our aim of regaining our industrial properity.

The Importance of Exports

Export trade after the war is of vital importance to us all, and all the partners in industry should think what they are going to do about it. Export is a British institution, as firmly incorporated in our national life as the House of Commons or the village pub, and export made our commercial supremacy in the long and prosperous years before 1914. In 1912, for example, more than one-third of our total trade was for export. Since then there has been a steady and progressive decline so that in 1938 it is estimated that not more than 15 per cent. of our output went abroad. The result of this was that in the year before this war our exports were £500 millions and our imports £900 millions. The gap, as we all know, was filled by what we called our invisible exports, our return upon overseas investments and our earnings from shipping and other services. When this war ends we shall face a very serious drop in investment return and our shipping position looks as if it would be drastically affected by the colossal growth of the American Mercantile Marine. It would, therefore, appear to be as certain as anything can be that if we are to make ends meet we must either increase our exports or reduce our imports. If we do the latter we must face a reduction in our pre-war standard of living. We cannot ignore the fact that the great mass of our people are hoping, and indeed demanding, that in the brave new world the general standard of living shall be higher than anything they have known in the past.

We do not know what international agreements will be made, to what extent freedom of trade may be restored, how far the peoples of the world will go to liberate themselves from the solitary confinement of economic nationalism. These things are all, doubtless, under discussion in the back rooms of diplomacy and any public utterances of statesmen give us reason to hope that the fever of high Protection has burned itself out, and that in a chastened and convalescent world we may at last realise that we are members one of another and that prosperity for one can only be achieved and maintained by prosperity for all. There are tremendous difficulties in the way. The whole trend of events in the last twenty years, greatly increased during the years of war, has been for more and more secondary industries to be started in countries whose chief interest should have been in the exchange of their primary products for the manufactures of their customers. Economic nationalism has been a world disease. Those secondary industries are now a vested interest and they will fight for their existance. One wonders if it has yet been realised in the raw-material and food-producing countries that every time they start a secondary industry they are reducing the market for their staple products. The converse is, of course, also true—when we refuse to buy we reduce our capacity to sell.

Without waiting, therefore, for Governments to disclose *their* plans, we in business should be making *ours*, for, in the end, whatever Governments may or may not do, it is upon our own efficiency, both in manufacture and salesmanship that we must rely. To accept tamely any suggestion that a reduction of imports is inevitable would be defeatism of the worst kind; none of us here would accept it for a moment. When the war ends there will be, all over the world, a great shortage of both capital and consumable goods. There will, for some years, be no lack of work for our factories, both for home trade and export. In fact the war-drive must give place to a peace-drive of equal intensity.

Post-War Controls

We must take it for granted that many controls will remain in force for a long time after the war, though one may hope that they may be simplified and that they may not be administered by interested parties. Two major controls will affect our export trade profoundly. Will priority, for material and labour, be given to export orders? What arrangements will be made for payment? I hope we may take it for granted that the answer to the first question will be an unqualified affirmative. The second question is more difficult; there will be many countries crying out for our manufactures, with no money and with no produce that they can exchange. Is there to be a return to the gold standard? A free

exchange system? Multilateral exchange clearing? We do not know.

Now, in many circles in this England of ours ignorance has never been considered to be a bar to public utterance, but a business man must practise a sterner virtue. Obviously, there must be international action. It is presumably being taken already in connection with the plans for providing food and raw materials to the freed countries. Might this not be taken a step further? Could not the Allied Governments be asked for the best estimate they can give of their first needs in capital equipment and consumable goods, so that Britain and the U.S.A. can plan the division of supply between them? In other words, should there not now be an international statistical survey of post-war needs? This should naturally lead to the establishment of a permanent International Statistical Service which would act as a governor for the world trade-engine.

There is one very simple step which all manufacturers can take; this is to get a post-war order book for export. From my own company estimates have been sent out and accepted on the following basis: (a) the price quoted is that at which the work could be executed to-day; (b) an undertaking is given that that price will finally be conditional upon the cost of material and labour when the work is actually put in hand; (c) we put in a safe-guarding clause that while we intend to use our standard materials, shortages of them may entail the use of the best substitutes available; (d) we state that we shall give notice when work is about to begin. At that time, if the purchaser finds that for economic reasons he cannot go forward with his plans, we will accept cancellation; but economic stringency alone can prevent the order from being a firm one. I need not stress the importance for every manufacturer of having a programme of certain production for which he can so plan that when the great turn from swords to ploughshares comes about, the change may be made efficiently and swiftly. A useful head of orders can be obtained now without the ordinary competition of the market; but that happy state of affairs will not endure. It gives us a useful breathing space, that is all

Export Groups

The bodies to whom we should look for intensive study of our problems, are, I submit, the Export Groups, with their central consultative committee, all under the wise guidance of the business members of the Export and Industrial Council of the Board of Trade. The potential usefulness of the groups remains and their members have now both time and opportunity to make plans for the industries they represent. It would be very useful if the Export Groups would consider how the services of the Export Credits Guarantee Department can be improved. This Department suffers under one great handicap. When it conducts its operations at a profit, and it has nearly always done so in peace time, it is not allowed to put that profit to reserve or to use it to lower premiums or to extend its services. The profit is taken into the national revenue for the year. This has always seemed to me to be wrong. The whole purpose of the Department should be to serve industry with the utmost efficiency. The Treasury argument is, presumably, that the State guarantees the Department and that net loss in any year would fall upon the Exchequer. It has been suggested that in peace-time the guarantees of the Department should apply to all exports and that the whole cost should be met by the Exchequer. That is a revolutionary proposal, but it might be explored.

The Export Groups will not be going outside their province if they consider also the problems of research and development. It is certain that the outlet for some of our standard pre-war exports will be curtailed. We shall need all our inventive skill in devising new products and processes, and we should pool our scientific knowledge for the task. We need in this country an equivalent to the Mellon Institute of Pittsburgh, one of the most useful institutions in the U.S.A. To the expert staff of that Institute the inventor can take his idea or the manufacturer his problem and, for a moderate charge, obtain the best scientific advice and help.

The Co-operative Spirit

These are all reforms which would help to make our export effort more efficient, but none of them will be of any use unless the industrial team at home, the investor, the manager and the worker, are pulling together in a truly co-operative spirit. Not for the first time, that greatest and wisest of our Imperial statesmen, General Smuts, has pointed the way for us. In an interview given just before he came to this country, he said:—"Our social system will be blown to hell, but there will be a new Socialism that will have nothing to do with politics or economics—a simple desire to give the other fellow a square deal." The first step towards this is found in the Beveridge Report. The common man may well look upon acceptance of it by Government as the acid test of sincerity of all the beneficient protestations of readiness to improve his lot. But apart from security, the common man is very much concerned with questions of his own status and of the general conduct of the industry in which he has invested the capital of his hand and brain.

There remains the great and vexed question of the structure of industry. What that remarkable document, "A National Policy for Industry," really proposes is a policy of self-government for industry. This is a phrase the meaning of which differs according to our taste and fancy. The authors of "A National Policy," as I understand them, lay down certain basic principles: (a) that industry exists to serve the community; (b) that the well-being of those engaged in it is a primary charge upon its activities, preceding profit to the investor; (c) that private enterprise should be maintained and encouraged, but that State control of certain industries may be necessary; (d) that efficiency in industry can best be maintained and increased by the use of, and the strengthening of Trade Associations and the enhancement of their power.

To the great end of increasing the efficiency of our industrial machine "A National Policy" proposes to maintain the supreme authority of Government and to strengthen the existing framework of our industrial machine. What safeguards, then, in the public interest, should be included in the definite proposals which our authors may put forward? One basic safeguard is already included in the plan—it is publicity—the full disclosure of accounts to Government and people is the best defence against unfair trading.

Further Safeguards

1. *The Statutory Corporation*: This form of concern should not be confined to Public Utilities. It should be used for all monopolistic or semi-monopolistic enterprises Indeed, one might go further. It was suggested some years ago by an imposing body of economists and business men that all companies controlling, directly or indirectly, more than 50 per cent. of the output or marketing of a product within Great Britain should come under the rule. In any event, the activities of all statutory corporations should be under continuous review by Government.

2. *The Sectional Associations*: The danger that is foreseen by many people is that these bodies may, possibly with the connivance of the Trade Unions concerned, set themselves to exploit the public. No one, I think, would deny that if the Associations worked always in the public service, nothing but good could come from the close collaboration of their members. The safeguard here is, firstly, publicity, and secondly, the right of Government to appoint a member with a watching brief for the community.

3. *The Central Council of Industry*: Here, I think, our authors go far short of what is needed. The Central Council should not represent employers only. It should be a fairly small body made up of equal numbers of employers and representatives of organised Labour, with a smaller number of disinterested persons appointed by Government.

Whatever detailed criticisms one may have to offer, "A National Policy for Industry" is an honest, and on the whole a successful effort to find, in the traditional British way, a compromise between the dyed-in-the-wool individualist and the doctrinaire who demands the control by the State of all the instruments of production, distribution, and exchange. It imposes still further upon the State the duty of providing the conditions, but it leaves the individual free to walk, in an ordered liberty, along the road of personal advancement, always providing that he does not do so at the expense of his neighbour. It recognises that, under whatever may be the system of the relationship of Government to industry and responsibility for its conduct, it must be much closer than it has been in the past; but under the rules which that relationship must impose, it gives every inducement to industry to work out its own salvation.

CONCRETE WATERPROOFING

An association of manufacturers of cement and allied products has been formed in London to establish a standard for an industry which has expanded rapidly since the war and is likely to be of importance in post-war building. Concrete waterproofing and hardening is a science which before the war was employed to a greater extent in the United States and on the Continent than in Britain. Hundreds of thousands of Anderson shelters have been made waterproof through the processes of this industry, which has also provided the appropriate concrete material for static water tanks, hardened floors of factories, and paving for aerodrome hangars.

THE PAINT INDUSTRY

The opinion that a new memorandum from the Ministry of Supply was a step towards concentration of the paint industry, and might lead to the closing of small firms, was expressed by paint manufacturers from all parts of Britain at a meeting in London last week. The memorandum lays down that paint for war purposes shall be obtained only from a few selected firms, and speakers contended that, although the Government had withdrawn an earlier scheme for compulsory concentration, the new scheme was the same idea in a different form. A resolution was passed calling for the abolition of the Miscellaneous Chemical Control's system of directing paint orders for Government contracts to selected firms.

Parliamentary Topics

Industrial Policy Manifesto

REPLYING to a question in the House of Commons last week, Sir Andrew Duncan, Minister of Supply, said that his permission had been neither requested nor obtained by three officials of his Ministry before they signed the manifesto, issued last November, entitled "A National Policy for Industry." Four names were mentioned in the question, which was asked by Mr. W. J. Brown; they were, Sir Nigel Campbell, head of the Non-Munitions Supply Industries Division, and a director of Stanton Ironworks and other firms; Mr. Graham Cunningham, Controller-General of Munitions Production, and chairman of Triplex Safety Glass and Lancegaye Safety Glass (1934); Sir Percy Mills, Controller-General of Machine Tools; and Sir Cecil Weir, Director-General, Equipment and Supplies.

Rubber Industry Specifications

Mr. Parker asked the Minister of Supply whether his technical departments under Dr. Roffey and Dr. Fox were responsible for the settling of specifications to be used by the rubber industry. Sir A. Duncan replied that the technical department gave advice, as requested, as to changes in specifications in the departments responsible.

Mr. Parker then asked the Minister whether he would take immediate steps to extend the use of those rubber substitutes which were recommended by his technical departments as being the best which could be produced from available raw materials. He also asked whether the Minister would expand the reclaiming industry to produce 50,000 tons per annum, such a figure not to include the manufacture of crumb rubber, which was not a plastic material, and the incorporation of which depended upon the quantity of plastic available in the rubber compound.

Sir A. Duncan, in reply, said that within the limits of available raw material, labour, and manufacturing capacity, every step was being taken to extend the use of those rubber substitutes which had been technically approved. The capacity for reclaiming was adequate in relation to requirements and to supplies of scrap available.

To a further question by Mr. Parker, Sir A. Duncan said he was satisfied there was no lack of co-ordination between the Service Departments and the Rubber Control in respect of the settling of specifications and the allocation of raw materials.

Mr. Parker asked the Minister of Production whether he had laid down a long-term policy regarding the provision and use of substitutes for rubber, based on the assumption that American synthetic rubber would not be forthcoming in the quantities anticipated. Mr Lyttelton, in a written reply, stated that since the entry of Japan into the war our policy had been to reduce consumption of rubber to a minimum, both by revision of specifications and by increased use of approved substitutes.

Technical Personnel Committee

Sir E. Graham Little asked the Minister of Labour the names, qualifications, and remunerations of the members of his technical personnel committee. Mr. Bevin replied that the committee consisted of civil servants and serving officers representing the Service, Education, and Supply Departments, the Ministry of Labour and National Service, the Board of Trade, and the Ministry of Works and Planning, together with Mr. Clement Jones, C.B., a director of the Booth Line, and Dr. A. P. M. Fleming, C.B.E., a director of Metropolitan-Vickers Electrical Company, Limited, and a member of the Engineering Advisory Committee. None of these received any remuneration in respect of his membership of the committee.

Producer-Gas Progress

In the House of Lords, the Minister of War Transport, Lord Leathers, said that substantial progress had been made in the development of producer-gas propulsion since July. Production plans for two standard types of producer had been completed, and steps had been taken for the supply of necessary spare parts. Some 530 bus-type producers had already been distributed, and company staffs were getting experience in their use. Further producers of this type would be delivered at a rate of 300 to 400 a month. Producers for goods vehicles had been more difficult, but the Minister hoped that manufacture would be completed by August. The difficulty of making fuel available had been overcome, and arrangements had been made for suitable stocks throughout the country; fuel would still be the limiting factor, however, though research was continuing into the design of apparatus and the widening of the range of available fuels.

GERMAN NON-METALLIC MINERALS

The increased importance of non-metallic minerals has caused the German authorities to subject them to the mining legislation in force for metallic minerals. Magnesite, bauxite, fluorspar, barytes, soapstone, silica, fullers' earth, china clay, feldspar, glimmer, etc., are affected by the new regulation which provides that where owners of land with deposits of these materials do not make suitable use of it, they can either be compelled to join forces with neighbouring landowners or to hand over the deposits to state-supported companies which would be responsible for the utilisation of the deposits.

New American Patents

Resin Pipes for Important Uses

A NEW material, which can replace steel pipe for a number of important uses, has been developed by the Flinkote Co., using "Vinsol," a synthetic resin made from pine resin by the Hercules Powder Co., and formerly used on a moderate scale for varnishes. The new material consists of layers of paper impregnated with the resin and subjected to a pressure of 1500 lb./sq. in. In addition to piping, the product can be used to make tough boards for the bodies of transport vehicles, and in containers for foods and petroleum oils and greases. Experimental work is under way to use it for automobile licence plates. The pipe is strong enough to support the weight of three or four men standing on a 12-foot section and so light that one man can easily carry half a dozen 12-foot lengths. An important use for the pipe is to replace steel tubing for shot hole casing in seismograph oil field exploration work. It is cheaper than steel, and has the advantage of being removable after a blast has been set off at the bottom of the well.

Much strategic magnesium metal, already fabricated but with small defects, can now be restored to usefulness, thanks to a new fusion method of welding, brought about by the close co-operation of two American industries. This new method of fusion welding, which takes advantage of the properties of helium, is the result of joint development by the Dow Chemical Co. and Northrop Aircraft Inc. Vital aircraft sand castings, some of which were formerly discarded because they did not meet standard specifications, can be reclaimed by the proposed method.

The helium arc method for welding magnesium alloys has an important bearing on war production progress, according to Dow. Its advantages over other methods include elimination of rivets, ease of operation, and greater speed of production over a wider range of design. Such results are possible because the electric arc applied to the parent metal is shielded by a blanket of inert helium which prevents oxidation of molten weld metal. Oxygen cannot penetrate the helium "envelope."

Artificial Carbon Dioxide

Among the new U.S. patents, Ogden Minton, of Greenwich, Conn., has taken out a patent (No. 2,302,136) for the artificial making of CO_2, so long as an underground stratum of limestone is available, with an impervious layer of clay or other tight material over it. He sinks a cased well into the limestone, pours in hydrochloric acid, and lets nature take its course. The gas that comes to the surface, under considerable pressure, is largely a mixture of carbon dioxide and water; the patent eliminates the water (largely as steam) and compresses the carbon dioxide.

Hercules Powder chemists have developed a new rubber-like plastic from cotton and alcohol. Ethyl cellulose is the base, the raw materials used being cotton linters or wood-pulp, common salt, and alcohol from natural gas or from fermented farm products.

The use of dibenzyl cynamide as an insecticide has just been patented (No. 2,300,588). The compound operates by contact and is directed primarily against soft-bodied sucking insect pests like aphids and red spiders. It is stated that dilutions of one part in 2000 have proved 100 per cent. lethal against citrus red spider. The compound can be used either as a spray emulsion or mixed with powdered inert materials to form a dust.

Counter to Mercury Vapour

A safety spray recently invented by a Californian chemist (U.S.P. 2,300,965) obviates some of the dangers of the evaporation of mercury from exposed ores and ore dust in mercury mines. The spray consists of a solution of the polysulphides of sodium, potassium, ammonia or other alkali base, to which spreader and adhesive compounds have been added. Applied to all exposed parts in the mine, it keeps the concentration of the mercury vapour down to a safe level, in which it is claimed the miners can work indefinitely without risk to their health.

Scratching of celluloid and other plastic sheeting during transport is prevented in an ingenious way by a recently patented invention (number not available). The sheeting is coated with a protective film of a material that will evaporate if exposed to the air for a short time. So long as the sheets are laid one on top of another, or the sheeting is rolled up, the substance will not evaporate—A chemical invention (No. 2,302,825) of importance is a means of reclaiming waste sulphuric acid that has become weakened with water and contaminated with carbon compounds through use in oil refining. The process is relatively simple. Sulphur trioxide gas is run through the diluted acid; the water takes up the gas and is converted into new sulphuric acid. The mixture is then freed of its carbon-containing contaminants by heating at 315°-325°C. for two hours or more, and the result is sulphuric acid of 98 per cent. strength.

LETTER TO THE EDITOR

Chemical Co-operation

SIR,—We, the undersigned, being members of the various bodies promoting the interests of chemists and chemistry, address ourselves in this letter to our fellow members.

We fully appreciate the services rendered to the progress of pure and applied chemistry and to the professional interests of chemists by the Chemical Society, the Society of Chemical Industry, and the Institute of Chemistry; we have, moreover, welcomed as a real step forward the important measures of co-ordination already effected between these services, including the work of the Bureau of Chemical and Physiological Abstracts and, in recent years, of the Chemical Council. We believe, however, that the results so far achieved are no cause for complacency, for we have yet a long way to go before chemists attain the unity necessary to enable them to take their fitting place in advancing the good of the community.

It seems to us increasingly clear that the majority of chemists in this country desire their profession to be united in purpose and in organisation, and are perplexed by what appear to them to have been unnecessary delays in achieving this object. We wish, therefore, at this moment to state concisely what seem to us the desirable functions of an organisation that will truly represent chemists and chemistry. Whatever the detailed structure of a Federal Body having such a purpose, it will need to administer and guide, in accordance with the clearly-expressed will of its members, all the main activities that concern chemists as professional men and working scientists. These relate to :—

1. Publications for the exchange and dissemination of chemical knowledge.
2. Scientific meetings to provide opportunity both for the discussion of problems under investigation and for the survey of specific fields of knowledge.
3. Libraries, both central and regional.
4. Qualifications, directed to the maintenance of a high standard of professional competence and of such methods of registration as the profession may decide, whether this registration have *de jure* or only *de facto* recognition by Government.
5. Publicity, to ensure that the general public be accurately informed, by the Press, by wireless, by films, and by any other means, of what chemists and chemistry are doing and could do for the benefit of the community.
6. Social security, whereby the economic position and the legal interests of all chemists may be safeguarded.
7. Social functions providing occasions when chemists may meet together to become better acquainted and, in particular, such conventions as will demonstrate to the public the unity of chemists and the importance of chemistry.

We believe it is essential to the performance of these functions that there should be a common secretariat, a Central House and close co-operation in all centres between all bodies promoting the interests of chemistry and chemists.

In this connection it may be remarked that we are fully aware of the steps that have been taken in many provincial centres to bring about closer co-operation between district or local sections and groups of various bodies—a process that has, if anything, been accelerated by war-time conditions. Indeed, our knowledge of what has taken place is one of the main reasons for our belief that chemists throughout the country would welcome more rapid progress in the suggested directions.

As a first step we call upon the Councils of the three Chartered Bodies to ask the Chemical Council for an immediate report on how to expedite the action advocated in this letter and to advise them whether the Agreement constituting the Chemical Council can be amended and extended to enable that Council to function with greater effect as a central organisation for co-ordinating all the services now performed for chemistry and for chemists by various separate and largely independent bodies. In the event of the Chemical Council being found to be so constituted as to make impossible its adequate remodelling, we desire that immediate steps be taken to set up some new Federal Body with a constitution suited to the purpose in view.

Chemists are undoubtedly cast to play an important part in planning and building the post-war world; they can only play it if they are willing to remodel their own organisation where this is necessary to meet the real needs of the future. We are confident that the overwhelming majority of chemists realise the necessity for putting their house in order and that this is the golden opportunity.—Yours faithfully,

E. F. ARMSTRONG; E. E. AYLING; S. AUMONIER; S. J. M. AULD; CHARLES A. ADAMS; S. A. ASHMORE; M. P. APPLEBEY; J. P. BANTER; JULIAN L. BAKER; E. C. C. BALY; REGINALD B. BROWN; C. E. BARTON; J. E. BYLES; M. BARROWCLIFF; H. V. A. BRISCOE; A. L. BACHARACH; S. BARRATT;

E. BRIGGS; C. H. BARTON; WM. CULLEN; H. J. CHANNON; H. E. COX; C. H. CLARKE; J. W. COOK; E. G. COUZENS; A. C. CHIBNALL; R. S. COLBORNE; C. J. T. CRONSHAW; J. E. COATES; FREDERICK CHALLENGER; W. A. DAMON; F. G. DONNAN; M. B. DONALD; E. C. DODDS, J. C. DRUMMOND; A. E. DUNSTAN; B. A. ELLIS; F. R. ENNOS; A. A. ELDRIDGE; E. V. EVANS; J. VARGAS EYRE; H. J. T. ELLINGHAM; H. J. EMELEUS; JOHN FERGUSON; A. G. FRANCIS; J. W. J. FAY; A. E. FINDLEY; J. J. FOX; ALEX. FINDLAY; W. W. GOULSTON; CHARLES S. GIBSON; J. MASSON GULLAND; F. H. GARNER; W. E. GARNER; J. G. A. GRIFFITHS; C. S. GARLAND; LESLIE J. HARRIS; T. P. HILDITCH; H. B. HUTCHINSON; I. M. HEILBRON; D. A. HOWES; E. L. HIRST; P. J. HARDWICK; C. E. HOLLIS; T. W. HARRISON; J. A. HETHERINGTON; PAUL HAAS; EDWARD T. HOBLYN; HAROLD HARTLEY; HARRY HEPWORTH; J. A. HEALD; FREDK. O. HOWITT; HAROLD HUNTER; E. LE Q. HERBERT; C. A. HIGSON; W. P. JOSHUA; R. H. JONES; H. JEPHCOTT; O. H. WANSBOROUGH JONES; LOUIS A. JORDAN; SYDNEY J. JOHNSTONE; D. JORDAN-LLOYD; J. S. JACKSON; J. KEWLEY; ALFRED A. KING; JOHN KING; F. B. KIPPING; L. H. LAMPITT; H. LANGWELL; R. LESSING; HERBERT LEVINSTEIN; B. D. W. LUFF; R. I. LEWIS; G. ROCHE LYNCH; H. W. MELVILLE; R. A. MORTON; P. M. MOONEY; H. MCCOMBIE; D. MORTON; V. E. S. MITCHELL; R. G. W. NORRISH; J. R. NICHOLLS; JOHN A. ORIEL; H. V. POTTER; GEORGE P. POLLITT; J. W. POOLEY; D. H. PEACOCK; A. T. PARSONS; ARTHUR M. PEAKE; R. PICKARD; J. DAVIDSON PRATT; A. J. PRINCE; F. ROFFEY; ERIC K. RIDEAL; ROBERT ROBERTSON; E. H. RODD; A. H. RHEINLANDER; H. S. RAPER; ROBERT ROBINSON; JOHN ROGERS; JAMES F. RONCA; F. SCHOLEFIELD; RICHARD SELIGMAN; H. M. STANLEY; E. W. SMITH; S. SUGDEN; J. STEPHENSON; F. S. SPRING; F. J. SMITH; FOSTER SPROXTON; R. E. SLADE; P. W. TAINSH; A. R. TODD; R. THOMAS; A. R. URQUHART; J. WEIR; W. L. WOOD; A. F. WEISS; J. W. A. WOODLEY; F. J. WILSON; F. G. YOUNG

Society of Chemical Industry

London Section's Meeting

THE annual general meeting of the London Section, Society of Chemical Industry, will be held in the rooms of the Chemical Society, Burlington House, W.1, at 2.15 p.m. on April 5, prior to the delivery of a paper by Mr. A. H. Bennett. The report, balance sheet, and accounts for the year ended December 31, 1942, will be considered, and members will be elected to fill the vacancies on the committee.

Chairman to Retire

The committee for the past year has been as follows: those who will retire in July, 1943, are shown in italics, and they are not eligible for re-election. *Chairman*: Dr. A. J. V. Underwood. *Vice-chairman*: Dr. T. H. Durrans. *Committee*: A. L. Bacharach, H. Baines, A. H. Bennett, *J. S. Carter, H. E. Cox*, B. A. Ellis, S. J. Johnstone, R. Lessing, *A. Parker*, L. R. B. Pearce, W. C. Peck, E. Lester Smith, R. Taylor, W. H. J. Vernon. Nominations are required to fill the three vacancies indicated on the committee. There is no set form of nomination, but each should be signed by not less than five members of the Section, and should reach the hon. secretary, Mr. T. W. Jones, 33 Tothill Street, S.W.1, not later than the first post on March 1. A member must not sign more than one nomination. Dr. Underwood retires from the chair and according to Rule 4 remains a member of the committee; the committee has elected Dr. R. T. Colgate to be chairman for 1943-44.

Temperature Measurement

New British Standard

WE have reached a stage in the war when the supply of energy for industrial processes has become one of the limiting factors in our war potential. It is, therefore, particularly opportune that the British Standards Institution should have published a comprehensive code standardising temperature measurement. The code (B.S. 1041) is the first of its kind published in any country and has involved several years of investigation by a strong committee of scientists, instrument makers, and engineers. The code covers the whole range of industrial thermometry starting with the International Temperature Scale, based mainly on the work of the National Physical Laboratory, and going through mercury thermometers, thermocouples, resistance thermometers, and radiation pyrometers of all kinds. A very valuable section deals with the sources of error, and there are also several sections covering special problems of thermometry such as the measurement of the temperatures of gases and liquids, and the surfaces and interiors of solids. In the preamble, the Code is stated to be of a provisional character issued for war purposes, and it will be subject to revision as soon as the situation permits. The Code has been in use in a number of laboratories and works for some time past on an experimental basis and its value has thus been thoroughly established.

Copies of this British Standard may be obtained from the B.S.I., 28 Victoria Street, Westminster, S.W.1, price 12s. 6d., post free.

Personal Notes

MR. E. A. G. LIDDIARD has been appointed research manager of the British Non-Ferrous Metals Research Association.

MR. R. D. BURN has been appointed by the Minister of Supply to be a deputy controller in the Non-Ferrous Metals Control.

MR. W. M. ROWLAND and MR. J. F. PHILLIPS have been appointed joint managing directors of the Universal Grinding Wheel Company, Ltd.

MR. R. A. MCCANCE, an authority on nutrition and the chemical composition of foods, has started on a lecture tour of Portugal and Spain.

MR. EDWARD PRATT, chief chemist at Bradford Conditioning House, last week completed 50 years' service in that department. He has held his present position for 37 years.

MR. W. M. DELF, of W. M. Delf & Co., soap manufacturers, Liverpool, has been re-elected president of the Birkenhead branch of the United Commercial Travellers' Association.

The Council of the University of Birmingham has converted the Lectureship in Pharmacology into a professorship, and DR. ALISTAIR C. FRAZER has been appointed to the new Chair.

MR. HENRY DEAKIN has been appointed chairman and MR. R. H. HAWORTH deputy chairman of Deakins, Ltd., Egerton Dyeworks, Bolton. MR. H. L. HASLAM, who has been manager and director for many years, is now managing director; he represents the third generation of his family to serve the firm in that capacity.

MR. VICTOR CASTLE, research chemist at the Royal Aircraft Establishment, Farnborough; DR. GEORGE HENRY LUNGE, F.C.S., F.I.C., chief chemist, Textile Research and Control Laboratory; and MR. GEOFFREY SHOEBRIDGE, research chemist with British Celanese, Ltd., were among those elected to membership of the Textile Institute at its January meeting.

DR. DONALD S. FREDERICK, of Philadelphia, U.S.A., has received the first John Wesley Hyatt Award to be made annually for an outstanding contribution to the plastics industry. The award, established by the Hercules Powder Company, goes to Dr. Frederick for his work in adapting transparent colourless acrylic plastics to the needs of American military aircraft.

Obituary

MR. WILLIAM BLACKWELL, who founded the Blackwell Oil Company in 1881, and was one of the first to offer hydrocarbon oils as lubricants instead of lard, has died at Aston, Birmingham, aged 82.

MR. HENRY GREGORY, managing director of the Veno Drug Co., Ltd., manufacturing chemists, died on February 6 in his home at Hale, Cheshire.

MR. HARRY GOODWIN HART, a managing director of Lever Brothers & Unilever, Ltd., in 1918-32, died at Lausanne, Switzerland, on February 5.

DR. C. C. FARR, D.Sc., F.R.S., F.Inst.P., Emeritus Professor of Physics at Canterbury College, Christchurch, died at Wellington, New Zealand, on January 27, aged 76. A native of Adelaide, Dr. Farr was educated at the universities of London, Adelaide, and Sydney, and had lectured in mathematics, electrical engineering, and physics in Australia and New Zealand. He held the Chair of Physics at the University of New Zealand in 1910-36, and became F.R.S. in 1928. Of interest to chemists, among his numerous publications, were works on the porosity of porcelain, and (with D. B. MacLeod) on the viscosity of sulphur.

New Control Orders

Mica

Under Direction No. 1 to the Control of Mica (No. 2) Order, persons dealing in prepared or built-up mica, may, notwithstanding Article 1 of the original Order, dispose of or acquire in one calendar month quantities of prepared or built-up mica not exceeding £5 in aggregate value of both sorts of mica dealt with; provided that every processor so disposing of mica shall furnish to R.M.2.C., Ministry of Supply, Carlton House Terrace, London, S.W.1, a return within seven days of the end of each month, in the form set out in the appendix to the Direction. The Direction (S. R. & O. 1943, No. 150) came into force on February 4.

Iron and Steel Scrap

The Ministry of Supply has issued the Control of Iron and Steel (No. 29) (Scrap) Order, 1943 (S. R. & O. 1943, No. 170), which came into force on February 10. The Order adds a new specification to the Table of Specifications set out in Table II B of the Iron and Steel (No. 14) (Scrap) Order, 1940, of scrap for use in the manufacture of steel ingots. This new specification, which is numbered 3(b), is substantially the same as the existing specification numbered 3, save that the scrap is limited in size to 1 ft. 6 in. in any direction. The price is the same as that at present in force for specification No. 2. The existing specification No. 3 has been slightly amended in the description and re-numbered as 3 (a). The price differential for quantities of 50 tons and upwards under the new specification is the same as that in force for specifications 4 to 15.

General News

Asbestos Industry Regulations, 1931 (Factory Form 939), as incorporated in the Factories Act, 1937, have been reprinted and issued by H.M. Stationery Office at the revised price of 3d., post free.

The new British Standard for identification of pipes, conduits, etc., in buildings, is intended to apply to all types of building *except* chemical works, for which a special scheme (B.S. 457) is already laid down.

A new Order (S.R. & O. 1943, No. 127), entitled the Trading with the Enemy (Specified Persons) (Amendment) (No. 2) Order, 1943, contains 485 additions to the black list of traders in neutral countries with whom dealings of any kind are illegal.

Lord Rothes, Director of Tyres, says the need of economy is greater than ever. He added that some synthetic rubber had been received from the United States for experimental purposes, and a small number of motor-car tyres had been made entirely from synthetic rubber.

The Board of Trade have, with the approval of the Treasury, decided that for the period beginning March 3 and ending June 2, 1943, the premium payable under Commodity Insurance Scheme policies shall be at the rate of 2s. 6d. per cent. per month. The monthly and three-monthly policies for a fixed sum and three-monthly adjustable policies hitherto issued will be continued. The new rate is a reduction of 50 per cent. on the rate for the current period.

The Ministry of Food announces that, where a non-domestic user has been authorised to obtain soap by means of a permit, no objection will be raised to the delivery of the soap so authorised for any four-weekly period during either the four weeks immediately preceding or immediately following that period. For example, suppliers may deliver supplies of soap authorised for the period, February 8 to March 7, at any time during the twelve weeks January 11 to April 14. This concession does not apply to the domestic soap ration.

Some idea of the advances in Canadian-made equipment since the war started was provided by a march-past of the Canadian Army held near London last Monday. Just before the parade, Mr. C. A. Banks, U.K. representative of the Canadian Department of Munitions and Supply, gave a review of the vast quantities of material, including chemicals and explosives, that had been produced, and revealed that the optical glass factory at Leaside (Ont.), now employing 6000 hands, had started a new industry from zero. Among the vehicles on parade was a mobile chemical warfare laboratory.

From Week to Week

Adequate supplies of blackcurrant syrup and purée, made from fruit of the 1942 crop, are now available, and the Ministry of Food has arranged for these to be sold only to children under 16, to invalids, and to others in need of vitamin C.

A letter from North Africa, published in the *Widnes Weekly News*, reveals that one of the first British paratroops to land in the North African campaign was a former employee at the Pilkington-Sullivan works of I.C.I. This is Private R. Bowyer, who is not yet 21, and we regret to add the further report that he is now seriously ill in hospital with multiple gunshot wounds.

Foreign News

Experiments are in progress in the U.S. to produce an all-plastic motor tyre. Plastic caps for bottles, already produced, will replace 140,000 tons of steel.

The production and sale of brandy and liqueurs have been banned throughout Italy, according to the Italian news agency. The alcohol is needed for vital war requirements.

Sunflower-oil production plant has been installed at Semendria, Yugoslavia, for the daily treatment of about 100 tons of seeds, which is said to be sufficient to cover the Serbian demand for vegetable edible oils.

Charcoal gas for lighting may be used in Italy if a demonstration by Professors Tramontano and Angeli, of Siena University, convinces the authorities of the value of the process.

Tomato offal from Italian canneries is now sent to Germany for use in Nazi laundries in place of soap. The offal is so treated that stained and soiled linen is cleansed like new without the necessity for rough handling.

Owing to shortage of coal-tar dyes, Nazi experts are reported to be producing colours from red cabbage. The dye passes under the name of "caulene," and is the base of a series of blue and green derived colours.

Systematic recovery of fats from fullers' earth is being undertaken in Belgium, and all firms that hold stocks of fullers' earth used in the treatment of wool, vegetable, and mineral oils must render monthly accounts of changes in stocks. Sale and treatment are subject to permits by the control authorities.

Construction of a big new steelworks has been completed near Chelyabinsk, in the Southern Urals, with a rolling mill 430 yards long, says Reuter from Moscow. The area covered by the plant and the workers' quarters comprises 30 square miles. The work was begun only last April.

New hydro-electric installations in Canada during 1942 aggregated 378,600 h.p., bringing the Dominion's total hydraulic development to 9,225,838 h.p. A new record of more than 37 billion kWh during the year has been made.

"The Palestine Trade Catalogue," a comprehensive guide to Palestinian industries, has just been published. It is designed to give detailed information about the productive capacity of the country, both now and after the war.

The Rumanian fertiliser and chemical company, "Nitrogen," has reported an increase in its output of calcium carbide, caustic soda, and hydrochloric acid, but the production of chlorine and potassium chlorate has declined.

Chile has bought from the United States the necessary equipment for the setting up of two factories for the rolling of copper and steel, according to the new Minister of Economy, Sr. Jaramillo. The two factories will start work before the end of the year.

Carofin S.A., the 10 million lei company formed last year in Rumania, has taken measures for the cultivation of rubber-like plants, and intends to erect processing installations. Another rubber substitute is to be produced by Ruberoid S.A., the subsidiary of Ruberoid A.G., of Hamburg, which operates a factory at Berceni, near Prahova.

Maize oil is now being produced in Bulgaria from the sprouts which millers must remove before milling the maize. All mills have been ordered to instal suitable plant, and a bonus is being paid to them for the removal of the sprouts which amount to about 7-8 per cent. of gross weight of the maize; the oil content is said to be about 16 per cent.

Castle Chemical Works, Ltd., 1090 King Street West, Toronto, Canada, is a newly-formed concern engaged in the manufacture of nickel catalyst for the hydrogenation and chemical industries. Messrs. Meade-King Robinson and Co., Ltd., of Liverpool, have been appointed the selling agents for Europe. The Canadian selling agents are The Canada Colors and Chemicals, Ltd., Toronto.

A central organisation, known as the "Bewirtschaftungsstelle" for chemical goods, was recently created by the Nazi Economic Department in Poland, with the aim of seizing all chemical raw materials produced in the country or imported, to distribute them to different industries according to the degree of their war importance, and later to distribute the manufactured chemical goods to retailers. Artificial fertilisers and tannery salts come first in importance, followed by soda products. The production of soap, glass, cellulose, glue, resin and the pharmaceutical industry is also likewise covered by the organisation.

The manager of a leading soap factory in Marseilles, René Armand, questioned on soap production in France, has stated that factory stocks of fat in the soap factories no longer exist. Resin is available only in small quantities, and tallow is used as an article of diet. In order to compensate for the shortage the amount of fatty acids in soaps has been progressively reduced to 10 per cent., and severer restrictions may be expected.

The possibility of eliminating mercury pigments in anti-fouling paint by using more copper powder was discussed at a meeting of the Marine Paint Industry Advisory Committee held in Washington, with representatives of the War Production Board. According to the Bureau of Conservation there is a considerable amount of copper powder available, while the toxic materials used in anti-fouling paints are scarce.

The Italian Oil Company "AGIP" has been working in Albania in the valley of Vojusa, near Devoli and Kucova. By December 31, 1941, 500,000 metres of borings had been carried out on about 700 drillings. A crude oil well has now been discovered in the limestone deposits of Kruja at a shallow depth, and the oil prospecting near Pathos, which was previously started by the Anglo-Iranian Company, has been resumed.

A new way of making wool-like fibres of viscose or similar synthetic materials is the subject of U.S.P. No. 2,302,077 issued to H. von Kohorn, of New York. In his process he first draws the filaments out under very little tension, so that they harden outside while they are still soft within. Then he pulls harder, cracking the first-formed "shell." This gives the rough surface that that is characteristic of wool and related animal fibres.

Forthcoming Events

A meeting of the **Royal Society of Arts** will be held at John Adam Street, Adelphi, at 1.45 p.m., on **February 16,** when Dr. S. S. Pickles will speak on "Rubber: Natural versus Synthetic."

The fourth and last in the series of lectures on "The Solid State," which are being given before the **Royal Institution,** by Sir Lawrence Bragg, will take place at 3 p.m., on **February 16.** The subject will be "Plus-plus Compounds."

The Agriculture Group and London Section of the **Society of Chemical Industry** will hold a meeting, at 2.30 p.m., on **February 16,** at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, when a paper on "Methods and Interpretation of Soil Analysis" will be presented by Professor G. W. Robinson.

The **Institute of Chemistry,** Birmingham and Midlands section, will meet at the Chamber of Commerce, New Street, Birmingham, at 5.30 p.m., on **February 17.** Mr. Garfield Thomas will speak on "Blood."

The Peter le Neve lecture of the **Royal Society of Arts** will be given by Dr. C. H. Desch, whose subject will be "Magnesium." The meeting will take place at John Adam Street, Adelphi, W.C.2, at 1.45 p.m., on **February 17.**

The 219th annual general meeting of the **Society of Glass Technology** will be held at Elmfield, Northumberland Road, Sheffield, on **February 17.** There will be two sessions, the first at 11.15 a.m., and the second at 2 p.m. Three papers on subjects connected with glass technology will be read by Mr. Robert Halle and Professor W. E. S. Turner, by Mr. T. Land, and by Dr. E. J. Gooding.

A meeting of the Road and Building Materials group of the **Society of Chemical Industry** will be held at 4 p.m., on **February 17,** at 1 Grosvenor Place, S.W.1, when there will be a general discussion on "The Rôle of Chemistry and Physics in Road and Building Industries," to be opened by a short paper by Messrs. A. W. Jarmay, F. M. Lea, F. M. Potter, and P. J. Rigden.

A lecture on "Glass Fibres" will be given before the Midlands section of the **Textile Institute,** by Mr. J. Boyd, at 7.30 p.m., on **February 18,** at Derby Technological College.

The Charter Centenary meeting of the **Pharmaceutical Society** will take place at 17 Bloomsbury Square, W.C.1, at 7 p.m., on **February 18.** The address will be given by Mr. W. Spencer Howells, president of the society.

The Yorkshire section of the **Textile Institute** will meet, at 6.30 p.m., on **February 18,** at the Midland Hotel, Bradford, to hear a lecture on "Recent Developments in Synthetic Fibres," by Mr. W. Hardacre.

A joint meeting of the **Institute of the Plastics Industry,** London section, with the Plastics Group of the **Society of Chemical Industry** will take place on **February 18,** at 6.30 p.m., at the Waldorf Hotel, Aldwych, W.C.2, when Dr. H. P. Staudinger will read a paper on "Structure and Properties of Thermoplastics."

There will be a meeting of the **Institute of Fuel** in the Geological Society's rooms, Burlington House, Piccadilly, W.1, at 2.30 p.m., on **February 18,** when Messrs. Alan Bean and William Brown will present a paper on "The Proximate Analysis of Coal," to be followed by a discussion.

The Tilden lecture of the **Chemical Society** will be given by Professor J. M. Gulland, who will take as his subject "Aspects of Nucleotide Chemistry." It will take place at Burlington House, at 2.30 p.m., on **February 18.**

The Edinburgh and East of Scotland sections of the **Society of Chemical Industry,** the **Chemical Society,** and the **Institute of Chemistry** will meet at 7.30 p.m., on **February 18,** in the North British Station Hotel, Edinburgh, to hear a lecture on "The Chemistry of Hashish," by Professor A. R. Todd. The lecture will be repeated at 7.30 p.m., on **February 19,** in the Royal Technical College, Glasgow.

A Jubilee Memorial Lecture of the **Society of Chemical Industry** will be held in the lecture theatre of the Corporation Gas Department, Parliament Street, Nottingham, at 3 p.m., on **February 20,** when Dr. W. H. J. Vernon's lecture on "The Corrosion of Metals in Air" will be repeated.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

BRITISH LUMINOUS INDUSTRIES, LTD., London, N.W. (M., 13/2/43.) January 18, £9000 debentures; general charge. *Nil. December 31, 1941.

J. GOODMAN (CHEMICALS), LTD., London, W. (M., 13/2/43.) January 22, £5000 debentures; general charge.

UNITED ALUMINIUM FOUNDRIES, LTD., London W. (M., 13/2/43.) January 18, £1500 (not ex.) equitable assignment, to Lloyds Bank, Ltd.; charged on moneys under orders.

Satisfaction

NEW CHEMICAL CLOSET CO., LTD., London, S.W. (M.S., 13/2/43.) Satisfaction, January 22, of debenture registered August 25, 1942.

Partnership Dissolved

FINE DYESTUFFS AND CHEMICALS CO. (Saml. Bradley, Andrew Phillips and Merrylee Chemicals, Ltd.), Calder Street, Manchester. December 15, 1942. Debentures by A. Phillips and Merrylee Chemicals, Ltd., who continue.

Company News

W. J. Bush and Co., Ltd., announce an interim dividend of 4 per cent. (same).

Genatosan, Ltd., announce an interim dividend of 10 per cent. (same).

Amalgamated Anthracite Collieries, Ltd., report that there will be no dividend on the preference shares for the half-year to April 1.

Milton Antiseptic, Ltd., report revenue for the year to September 30, of £59,095 (£56,944). The final dividend of 7½ per cent. has already been announced.

Guildford Cellulosing, Ltd., Walnut Tree Close, Guildford, have increased their nominal capital by the addition of £1000 in £1 ordinary shares beyond the registered capital of £1000.

Minerals Separation, Ltd., announce a final dividend of 15 per cent. (20 per cent.), making 25 per cent. (40 per cent.) for the year ended December 31, and a profit of £68,982 (£98,829) before deduction of tax, etc.

The directors of **The Gas Light and Coke Company** have decided to pay, on March 25, dividends for the year ended December 31 of 4 per cent. (nil) on the 4 per cent. consolidated preference stock, 3¾ per cent. (nil) on the 3¾ per cent. redeemable preference stock, 1970, 1¼ per cent. (nil) on 3½ per cent. maximum stock, and 1 per cent. (nil) on the ordinary stock.

New Companies Registered

Tool Processes, Ltd. (378,591).—Private company. Capital: £5000 in 5000 shares of £1 each. Industrial chemists in connection with tools, gauges and motor and engineering trades equipment, etc. First director: H. G. M. Wilson, 26 Queen Victoria Road, Coventry.

Shellac Distributing Agency, Ltd. (378,501).—Formed as a company limited by guarantee without share capital to co-operate with the Ministry of Supply in the allocation and distribution of shellac in the United Kingdom. Directors: S. C. Downham; W. C. S. Elphinstone; S. Isaacs; N. Lind; and H. Parsons. Registered office: 24-25 Fenchurch Street, E.C.3.

Chemical and Allied Stocks and Shares

QUIET and steady conditions have continued to rule in Stock Exchange markets, and where changed, industrial shares were within a few pence of quotations ruling a week ago. The absence of improvement in the volume of business was attributed partly to the withholding of funds in preparation for the coming "Wings for Victory" campaign. The continuance of a more cautious market tendency was also attributed to the recent references of the Chancellor of the Exchequer to the problems and controls that will have to be faced in the post-war period.

At 38s. Imperial Chemical were within 3d. of the price current a week ago, and the 7 per cent. preference units were slightly lower at 36s. Borax Consolidated at 35s. 3d. maintained their recent improvement, awaiting the dividend announcement, while elsewhere B. Laporte were firmly held and inclined to show further improvement, dealings up to 79s. 4½d. having been recorded. Burt Boulton remained rather more active and were maintained at 19s., while British Oxygen were favoured and further improved from 76s. 3d. to 76s. 9d. On the other hand, British Aluminium went back 6d. to 49s., and Turner & Newall lost a similar amount to 76s. 3d. Cooper McDougall tended to improve, having transferred up to 26s. 3d.; the 7 per cent. preference shares were 28s. 9d. Talk of possibilities of a less conservative dividend payment was reflected by a moderate improvement to 14s. in General Refractories 10s. shares. In other directions, United Glass Bottle transferred at 61s. 3d. and, awaiting the dividend, Canning Town Glass 5s. ordinary were better, with dealings up to 7s. 10½d. Although "ex" the interim dividend, W. J. Bush continued to be quoted at 50s.

British Tar Products changed hands up to their par value of 10s., and British Emulsifiers 2s. shares were again active around 3s. 3d. Greeff-Chemicals 5s. ordinary have changed hands at 6s. 10½d., and William Blythe 3s. shares around 7s. 7½d. Lever & Unilever were slightly lower at 34s., but the units of the Distillers Co. had a relatively steady appearance at 87s. 6d. Awaiting the results, Fisons ordinary showed further improvement from 43s. to 44s. 4½d. Nairn & Greenwich at 62s. 6d. recorded an improvement of 1s. 3d., although elsewhere Barry & Staines moved back from 39s. 4½d. to 38s. 6d. At 92s. 6d Thomas De La Rue failed to regain their recent decline, but remained fairly active. Among other shares of companies interested in plastics, Erinoid 5s. ordinary changed hands up to 11s. 9d., Lacrinoid Products around 4s. 9d., and Catalin up to 3s. 9d. British Industrial Plastics 2s. ordinary were around 5s. 1½d.

Lawes Chemical ordinary were more active and changed hands up to their par value of 10s. British Glues & Chemicals 4s. shares were maintained at 7s. 6d. Cellon 5s. ordinary remained at 17s. 3d., and Goodlass Wall 10s. shares transferred up to 12s. 10½d. At 38s. 1½d. British Match remained a firm feature, and British Plaster Board at 27s. 6d. were also unchanged

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on balance. In other directions, Lancashire Dynamo shares were at the higher level of 80s. 6d., awaiting the financial results, but elsewhere English Electric were easier at 47s. 6d., although the repetition of the dividend at 10 per cent. was in accordance with general expectations, particularly in view of the larger capital in issue. Firmness was shown by Murex at 107s. 6d. following an earlier reaction; on the basis of the 20 per cent. dividend which has ruled for many years, the yield is small, but last year 40 per cent. was earned and a large sum was placed to reserve. Steadiness was shown in Boots Drug 5s. ordinary at 40s., while Sangers 5s. shares were 21s. 9d., and Timothy Whites 26s. 10½d. British Drug Houses were unchanged at 22s 6d. Anglo-Iranian, Burmah Oil, and other leading oil shares reflected the easier trend in Stock Exchange markets.

British Chemical Prices

Market Reports

A FAIR volume of inquiry has been circulating in the general chemicals market during the past week and the movement into consumption, so far as the principal industrial outlets are concerned, has been on steady lines. There has been no apparent easiness in the price position and in most instances the undertone is very firm. During the week a moderate amount of business has been done in liquid and solid caustic soda and interest in industrial refined nitrate of soda has been fully maintained. Chlorate of soda and bicarbonate of soda are in good request, with supplies rather scarce. There has been no change in the position of yellow prussiate of soda and offers are on a small scale. Quotations for the potash chemicals show little fresh movement for the week and the general supply position is tight. Acid phosphate of potash is a good market. Among the miscellaneous chemicals, British-made formaldehyde meets with a steady inquiry and a good call for actual deliveries is also reported, while white powdered arsenic is in steady request, with values on a firm basis. A fair weight of inquiry is reported in the coal-tar products market, with steady conditions prevailing in all sections. Offers of creosote oil, carbolic acid, and cresylic acid are readily absorbed and a moderate demand is reported for the anthracene oils and the naphthas.

MANCHESTER.—Strong price conditions generally have been reported during the past week on the Manchester market for chemical products. Actual price changes have been few, but the undertone is undoubtedly firm. The ammonia compounds are meeting with a steady demand and a sharp rise has been reported in values of persulphate. Caustic soda and the other soda products are being taken up in good quantities, chiefly under contracts, while a steady trade is passing in a number of other sections, including alum. Most of the tar products, both light and heavy, are moving briskly into consumption.

GLASGOW.—There has been no actual change in the Scottish heavy chemical trade during the past week, home business maintaining its steady day-to-day transactions. Export trade is rather restricted. Prices still remain very firm.

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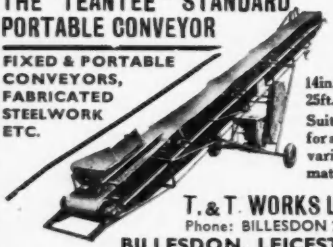
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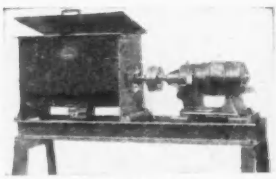

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